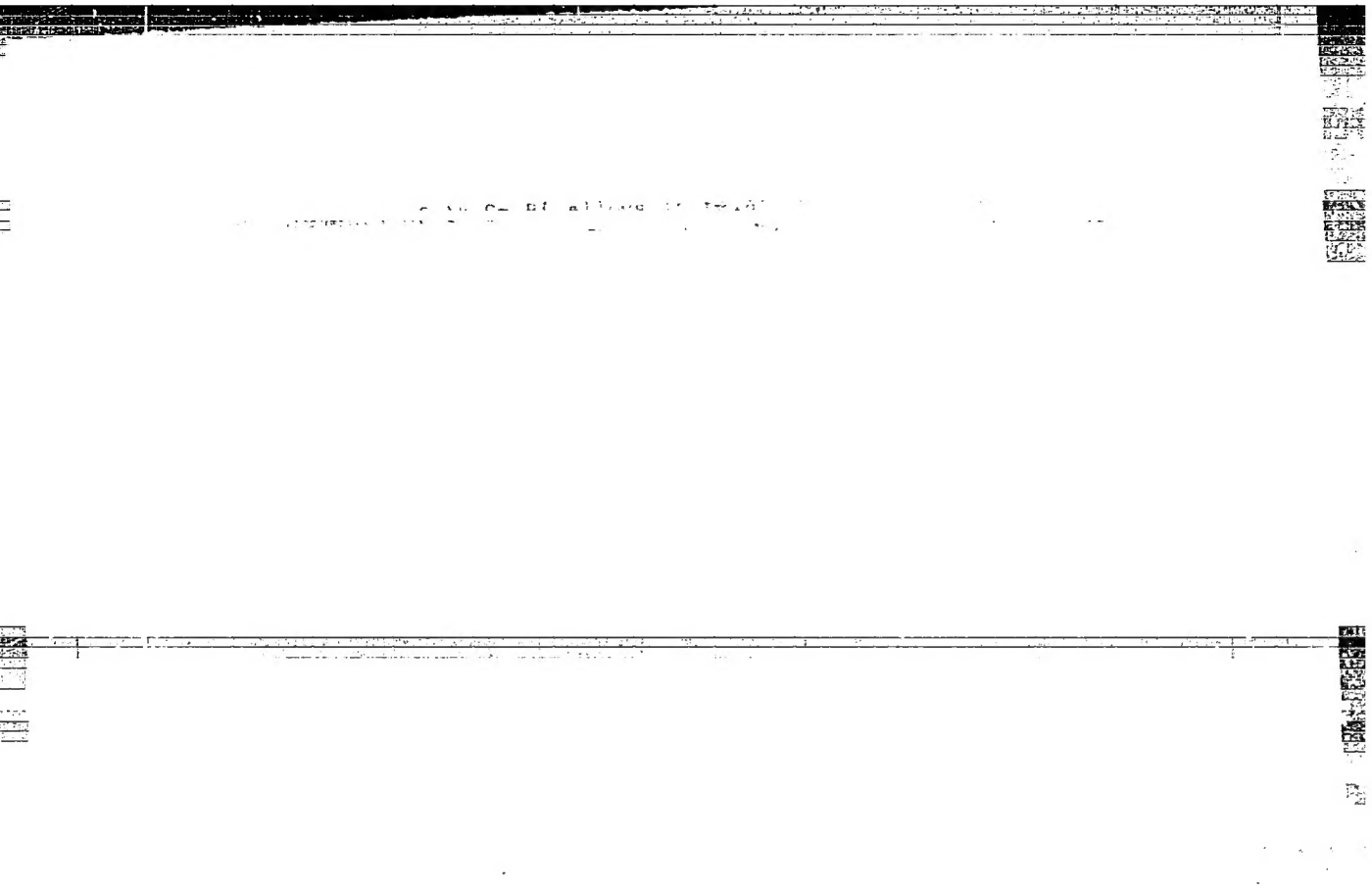

[illegible], [illegible]; [illegible], [illegible] [illegible], [illegible] [illegible], V.[illegible]

Study of the surface tension in the system [illegible] - [illegible]. Dokl. AN SSSR 155 no.1:75-78 M[illegible] '64. ([illegible] 17:4)

1. Moskovskiy gosudarstvennyy universitet im. M.V.[illegible] i Moskovskiy tekhnologicheskiy institut im. D.I.Mendeleyeva. Predstavleno akademikom A.V.Shubnikovym.

IBRAGIMOV, K.M.

Phosphorus transformation in the soils of the Mugan Steppe. Izv. AN Azerb. SSR 21 no.3:92-95 '65. (MIRA 2:87)

IBRAGIMOV, K.Sh.

Using the linear flow method for solving a problem on oil-water boundary displacement control. Izv.vys.ucheb.zav.; neft' i gaz 4 no.7:59-66 '61. (MIRA 14:10)

1. Kazanskiy gosudarstvennyy pedagogicheskiy institut.
(Oil reservoir engineering)

IBRAGIMOV, K.Sh.

Maximal oil recovery in dual line drive. Izv. vys. ucheb. zav.; neft' i gaz 5 no.7:37-41 '62. (MIRA 16:7)

1. Bashkirskiy gosudarstvennyy universitet.
(Oil field flooding)

IBRAGIMOV, Kh. Z.

Primenenite Fenotiazina Pri Strongilya Tozakh i Paraskaridozakh oslov, "Works on Helminthology," on the 75th Birthday of K. I. Skryabin, Izdat, Akad. Nauk, SSSR, Moskva, 1953, p. 263
Chair Parasitology, Uzbek Agricultural Institute in V. V. Kuybyshev

IBRAGIMOV, Kh. Z.

USSR / Diseases of Farm Animals. Toxicoses.

Abs Jour: Ref Zhur-Biol., No 8, 1958, 35861.

Author : Ibragimov, Kh. Z., Koroleva, A. V.
Inst : Uzbekistan Institute of Agriculture.
Title : Bilirubin in Horse Blood in Connection with Sulla Poisoning.

Orig Pub: Nauchn. tr. Uzb. s.-kh. in-ta, 1956, 10, 181-185.

Abstract: The content of bilirubin in the blood serum of horses suffering from sulla poisoning increases to 25.6 milligram percent. As the condition of the sick animal becomes worse, the bilirubin content tends to increase; improve-

Card 1/2

USSR/Diseases of Farm Animals - Diseases of Unknown Etiology. R-3

Abs Jour : Ref Zhur - Biol., No 4, 1958, 16939

Medicinal substance	Dose in ml. To foals from 1 to 2 years	Dose in ml. To adult horses 3 years old and over
5% solution of sodium chloride	75-100	150-200
Sodium bicarbonate	7.0	10.0
Glucose	20.00	40.0
Chloral hydrate	5.0-6.0	0.7-10.0

A hypertonic solution of NaCl and sodium bicarbonate was

Card 2/3

USSR/Diseases of Farm Animals - Diseases of Unknown Etiology. R-3

Abs Jour : Ref Zhur - Biol., No 4, 1958, 16939

used for the improvement of the tone of the cardiovascular system and decrease of the pulmonary edema; glucose was used as an antitoxic and for the improvement of nutrition of the cardiac muscle, and chloral hydrate to increase the depth of respiration. The treatment was conducted according to the following method: on the 1st and 2nd day, at first an infusion of strophanthus, and 30 min. later a freshly prepared solution of the above compound, were introduced intravenously; on the 4th and 5th day, same medication as on the 1st and 2nd day but with substitution of the infusion of digitalis for strophanthus; on the 7th and 8th, same medication as on the 4th and 5th day. Of 17 horses treated by this method, 12 recovered and 5 died. The treatment was effective only when instituted during the first week of disease. -- T.A. Radchenkova.

* [A noninfectious disease of horses characterized by the development of interstitial pneumonia.]

Card 3/3

IBRAGIMOV, Kh.Z.

IBRAGIMOV, Kh.Z.

Experimental intoxication of animals with smuts and its connection with the "suiliuk." Dokl. AN Uz.SSR no.7:67-70 '58. (MIRA 11-10)

1. Uzbekskiy sel'skokhozyaystvennyy institut imeni V.V. Kuybyshova. Predstavlano akademikom AN UzSSR S.Yu.Yunusovym.
(Smuts--Toxicology)

IBRAGIMOV, Kh.Z.

Early diagnosis of "suiliuk" in horses. Dokl.AN Uz.SSR no.11: 61-63 '58. (MIRA 11:12)

1. Uzbekskiy sel'skokhozyaystvennyy institut imeni V.V. Kuybysheva. Predstavleno akademikom AN UzSSR S.Yu.Yunusovym.
(Horses--Diseases)

ACC NR: AR6035099 SOURCE CODE: UR/0137/66/000/008/A005/A005

AUTHOR: Ibragimov, Kh. I.; Pokrovskiy, N. L.; Pugachevich, P. P.; Semenchenko, V. K.

TITLE: Investigation of the surface tension of the tin-bismuth and tin-lead systems

SOURCE: Ref. zh. Metallurgiya, Abs. 8A139

REF SOURCE: Sb. Poverkhnostn. yavleniya v rasplavakh i voznikayushchikh iz nikh tverd. fazakh. Nal'chik, 1965, 169-276

TOPIC TAGS: tin, bismuth system, tin lead system, surface tension, temperature coefficient, gravitation method

ABSTRACT: The surface tension σ of the Sn—Bi (14 alloys) and Sn—Pb (13 alloys) systems has been investigated by the gravitational method. The isotherms and polytherms obtained did not show extreme or bend points. The eutectic fields of both systems were carefully analyzed. The study of the relation $\sigma=f(t)$ revealed a number of new phenomena. With increased concentration of one of the components, a regular decrease of the temperature coefficient of the

Card 1/2 UDC: 669.6'4-154:532.61

ACC NR: AR6035099

surface tension $d\sigma/dt=K$ is observed. For the Sn—Bi system, K passes through zero twice, while for the Sn—Pb system, the values $K<0$. Orig. art. has: 5 figures. Bibliography of 7 titles. G. Fents. [Translation of abstract] [NT]

SUB CODE: 11/

Card 2/2

KOSTEV, V.A.; IBRAGIMOV, L.A.

Economic effectiveness of the use of tractors in the transportation of farm loads. Trakt. i sel'khozmash. no.4:33-34 Ap '65. (MIRA 18:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy sel'skokhozyaystvennogo mashinostroyeniya.

37998. IBRAGIMOV, M.

O Bazisakh Myesyetabyelyevykh R-Grupp, Vsye Podgruppy Kotorykh Myetabyelyevy. Trudy Samarkandsk. GOS. UB" YEDIN. Pyed. I Uchityel. In-Ta in. Gor Kogo, T VI 1948, S. 103-108

IBRAGIMOV, M.: Master Biol Sci (diss) -- "The properties of the membranes of the ova of Ascaris suum and the mechanism of larval hatching". Leningrad, 1958. 19 pp (Leningrad Order of Lenin State U im A. A. Zhdanov), 150 copies (KL, No 6, 1959, 129)

IBRAGIMOV, M.

Contribution of the Uzbek youth. Zashch. rast. ot vred. i bol. 5 no.1:8-9 Ja '60. (MIRA 14:6)

1. Pervyy sekretar' TSentral'nogo komiteta Leninskogo kommunisticheskogo soyuza molodezhi Uzbekskoy SSR. Zashch. rast. ot vred. i bol. 5 no.1:8-9 Ja '60. (MIRA 14:6)
(Uzbekistan--Plants, Protection of)

IBRAGIMOV, M.

School traditions. Prof.-tekh.obr. 19 no.2:22 F '62. (MIRA 15:2)

1. Direktor remeslennogo uchilishcha No.2, g. Tashkent.
(Vocational education)

IBRAGIMOV, M.

Photosynthesis and respiration intensity related to varying doses of nitrogen nutrition. Uzb. biol. zhur. 9 no.4:26-29 '65.
(MIRA 18:10)

1. Institut eksperimental'noy biologii tekhnicheskikh i zernovykh kul'tur AN UzSSR.

COUNTRY : USSR G
CATEGORY : Zooparasitology. Parasitic Worms. General Problems

ABS. JOUR. : RZhBiol., No. 4 1959, No. 15005

AUTHOR : Ibragimov, M.
INST. : Andizhan State Pedagogical Institute
TITLE : On the Problem of the Development of Eggs of Ascaris suis Under Different Environmental Conditions
ORIG. PUB. : Uch. zap. Andizhansk. gos. ped. in-t, 1957, 6, 173-187
ABSTRACT : The development of eggs (E) of Ascaris suis in 0.5% solution of HCl, 0.5% H_2SO_4, 0.5% CH_3COOH, and 2% NaOH at 26-28° is terminated within 13 days (one day sooner than in the control) by the formation of moving larvae. The development of E in the above-mentioned solutions begins one day following their removal from the uterus, and the disappearance of the protein membrane is observed, whereas in the water the development starts after two days and the protein membrane

CARD: 1/4

G

CATEGORY :

ABS. JOUR. : RZhBiol., No. 4 1959, No. 15005

AUTHOR :
INST. :
TITLE :

ORIG. PUB. :

ABSTRACT cont'd. : is preserved up to the end of the development. In the solutions of acids and alkalies the development of E runs synchronously, unlike the non-synchronous development in water. The optimal temperature for the development of E is 29-34°; at 13-16°, E reach the stage of larvae only by the 60th day. At 0° (-7°), E preserved viability for one month. Cold has no influence in subsequent

CARD: 2/4

USSR / General Biology. Individual Development. B-4

Abs Jour : Ref Zhur - Biol., No 12, 1958, No 52406

Author : Ibragimov, M.
Inst : Leningrad University
Title : New Experimental Data on Hatching of the Larvae of Swine Ascarides (Ascaris Suum).

Orig Pub : Vestn. Leningr. un-ta, 1957, 12, No. 9, 106-115

Abstract : Ascarid eggs grown in water, in 5% HCl and in soil, were mixed with "gastric liquid", commercial gastric juice, pancreatin, and bile. In other experiments with swine, white rats, and guinea pigs, invaded eggs were fed at predetermined times. Substances present in the stomach affect the hatching time so that intensive hatching proceeds in the "gastric liquid" in vitro and in the stomach of the infected young pig. In the bile and pancreatin only 25% of the larvae hatch. -- K. K. Surikova.

Card 1/1

IBRAGIMOV, M.

Effect of light on the intensiveness of photosynthesis in different varieties of cotton. Usb. biol. zhur. no.5:22-27 '61. (MIRA 17:2)

1. Institut genetiki i fiziologii rasteniy AN UzSSR.

ACCESSION NR: AP4024192 S/0294/64/000/001/0071/0077

AUTHOR: Subbotin, V. I.; Ibragimov, M. Kh.; Nomofilov, Ye. V.

TITLE: Statistical investigation of turbulent temperature pulsations in a liquid stream

SOURCE: Teplofizika vy*sokikh temperatur, no. 1, 1964, 71-77

TOPIC TAGS: temperature pulsation in stream, turbulent temperature pulsation, turbulent water stream, turbulent liquid metal stream, autocorrelation function, correlation function, normalized autocorrelation function, jet shaped turbulence, semiempirical turbulence theory, normalized correlation function

ABSTRACT: Results are reported of measurements of temperature pulsations in turbulent streams of water and liquid metal, measurements of the normalized autocorrelation and mutual correlation functions, and measurement of the turbulence scales. A stainless steel tube with specially treated internal surface was used for the flow, and a motor driven thermocouple probe was used to plot the temperature distribution. Various measurement steps are detailed. It is concluded that the turbulent-disturbance region is

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ACCESSION NR: AP4024192

cylindrical in form, so that the disturbances themselves are shaped like jets and cannot be represented by small spheres as is extensively done in semiempirical turbulence theories. Orig. art. has: 7 figures and 8 formulas.

ASSOCIATION: none

SUBMITTED: 03Sep63 DATE ACQ: 16Apr64 ENCL: 01

SUB CODE: PH NO REF SOV: 006 OTHER: 004

Card 2/3

IBRAGIMOV, M.A., dots.

N. Narimanov, outstanding revolutionary and physicism.. Azerb.med. zhur. no.1:69-76 Ja '58 (MIRA 11:12)
(NARIMANOV, NARIMAN HADZHAF,ogly, 1870-)

IBRAGIMOV, M.A., dots.

Dzhamil Nasirovich Lemberanskii; obituary. Azerb.med.zhur. no.5:78-80 My '59. (MIRA 12:8)
(LEMBERANSKII, DZHAMIL NASIROVICH, 1884-1959)

IBRAGIMOV, M.A., dotsent

History of hospital development in Azerbaijan, 1868-1958.
Sov.zdrav. 18 no.7:26-30 '59. (MIRA 12:9)

1. Iz kafedry organizatsii zdravookhraneniya i istorii meditsiny Azerbaydzhanskogo instituta usovershenstvovaniya vrachey.
(HOSPITALS, hist.
in Russia (Rus))

IBRAGIMOV, M.A., dotsent

Organization of the public health system in the Azerbaijanian S.S.R. in 1920-1921. Zdrav. Ros. Feder. 4 no.9:38-39 S '60. (MIRA 13:9)

1. Iz kafedry organizatsii zdravookhraneniya i istorii meditsiny Azerbaydzhanskogo instituta usovershenstvovaniya vrachey.
(AZERBAIJAN—PUBLIC HEALTH)

IBRAGIMOV, M.A., dotsent (Baku)

Reorganization of the district public health service. Sov. zdrav. 19 no. 8:25-30 '60. (MIRA 13:10)

1. Iz kafedry organizatsii zdravookhraneniya i istorii meditsiny Azerbaydzhanskogo instituta usovershenstvovaniya vrachey.
(AZERBAIJAN--PUBLIC HEALTH)

IBRAGIMOV, M.A., dotsent (Baku)

Baku University of Health. Sov.zdrav. 20 no.2:56-58 '61.
(MIRA 14:5)

1. Rektor Bakinskogo universiteta zdorov'ya, zaveduyushchiy kafedroy organizatsii zdravookhraneniya i istorii meditsiny Azerbaydzhanskogo instituta usovershenstvovaniya vrachey.
(BAKU--HEALTH EDUCATION)

IBRAGIMOV, M.A.; RUSTAMOV, I.A.

Gasan-bek Melikov Zardabi (1842-1907). Gig.i san. 26 no.3:45-50 Mr '61. (MIRA 14:7)

1.Iz Azerbaydzhanskogo instituta usovershenstvovaniya vrachey i Azerbaydzhanskogo universiteta imeni S.M.Kirova.
(ZARDABI, GASAN-BEK MELIKOV, 1842-1907)

IBRAGIMOV, M.A., docent

People's health universities as the best form of the organization of health education in the current stage of development of Soviet public health. Cesk. zdravot. 9 no.6:376-380 '61.

1. Rektor lidove university zdravi v Baku, vedouci katedry organizace zdravotnictvi a dejin lekarstvi Azerbajdzanskeho ustavu pro doskolovani lekaru.

(HEALTH EDUCATION)

IBRAGIMOV, M.A., dotsent

The new program of the CPSU is the most important contribution to the future development of Soviet public health. Azerb.med. zhur. no.2:3-9 F '62. (MIRA 16:4)

(PUBLIC HEALTH)

IBRAGIMOV, M.A., dotsent (Baku)

New stage in the development of Soviet public health. Sov.zdrav. 21 no.7:6-11 '62. (MIRA 15:8)

1. Iz kafedry organizatsii zdravookhraneniya i istorii meditsiny Azerbaydzhanskogo instituta usovershenstvovaniya vrachey (zav. - dotsent M.A.Ibragimov).

(PUBLIC HEALTH)

IBRAGIMOV, M.A., dotsent (Baku)

Mirza Fatali Akhundov, prominent Azerbaijani thinker of the 19th century (1812-1878). Sov.zdrav. 21 no.12:41-47 '62.
(MIRA 15:12)

1. Zaveduyushchiy kafedroy organizatsii zdravookhraneniya i istorii meditsiny Azerbaydzhanskogo instituta usovershenstvovaniya vrachey.

(AHUND-ZADE, FETH ALI, 1812-1878)

IBRAGIMOV, M.A., dotsent

Public health in the Mongolian People's Republic. Sov. med. 25 no.4:149-151 Ap '62. (MIRA 15:6)

1. Iz kafedry organizatsii zdravookhraneniya i istorii meditsiny (zav. -- dotsent M.A. Ibragimov) Azerbaydzhanskogo instituta usovershenstvovaniya vrachey.
(MONGOLIA--PUBLIC HEALTH)

IBRAGIMOV, M.A.

Two years' work of a public health university. Azerb. med. zhur. no.6:29-35 Je '62. (MIRA 17:8)

HUNGARY

IBRAGIMOV, M.A. [Affiliation not given].

"Public Health in the Mongolian People's Republic"

Budapest, Orvosi Hetilap, Vol 103, No 49, 9 Dec 62; pp 2332-2334.

Abstract: A brief review, based on an article in Sov.Med. 1962, No 4, of the development of public health institutions and medical facilities in the Mongolian People's Republic. Prior to the popular revolution in 1921 Mongolia did not have a single public health institution or Mongol physician. Until 1942 Mongol physicians obtained their diplomas in the Soviet Union; in 1942 the first Mongol University was created, and the first 13 physicians trained at this university were graduated in 1947. At the present time between 100 and 120 physicians are graduated annually The ratio of physicians to inhabitants has risen from 1 physician to every 24,000 inhabitants in 1930 to 1 physicians to every 1,000 inhabitants in 1962. There are 2,500 public health stations currently in operation, 18 district hospitals with 100-105 beds each, and 3 major hospitals in the capital. In 40 years the birth to death ratio has increas tremendously.

1/1

IBRAGIMOV, M.A., dotsent (Baku)

Certification of physician specialists. Sovet. zdravookhr. 12 no.1:33-37 '63 (MIRA 17:2)

IBRAGIMOV, M.A.

Attestation of physician specialists - the most important problem of the public health institutions. Azerb. med. zhur. 40 no.5:72-78 My '63. (MIRA 17:9)

IBRAGIMOV, M.G., inzh.

Device for the brake lever of the U2-4-5 winch. Bezop.truda v prom. 5 no.7:30 Jl '61. (MIRA 14:6)

1. Kaltasinskaya kontora buren'iya tresta Bashvostokneftеrazvedka. (Winches)

IBRAGIMOV, Magomet Ibragimovich; ABRAMOV, A.L., red.; MEMESHKINA, L.I., tekhn. red.

[Creative search] Tvorcheskie poiski. IUzhno-Sakhalinsk, Sakhalinskoe knizhnoe izd-vo, 1963. 19 p. (MIRA 16:11)

1. Master Pevoy neftedobyvayushchey brigady promysla "Vostochnaya Ekhabi" Sakhalin (for Ibragimov).
(Petroleum production)

IBRAGIMOV, M I

AID P - 3953

Subject : USSR/Hydr. Eng.

Card 1/1 Pub. 35 - 17/19

Authors : Pulatov, N. Yu. and M. I. Ibragimov, Eng.

Title : Quick method of establishing the moisture content of soil.

Periodical : Gidr. stroi., 7, 43-44, 1955

Abstract : A device of the "061" type, used at the construction of the Ortotokoy dam erected by the hydraulic fill method, is described in detail. This device permits quickly establishing the moisture content in the soil. A detail description of the device and its operation is given.

Institution : None

Submitted : No date

Control of the compactness of large breccia-like soils in building the Orto-Tokoi dam. Gidr.stroi. 25 no.10:50-52 N '56.
(Orto-Tokoi Reservoir) (Soil mechanics) (MLRA 9:12)

IBRAGIMOV, M.I., inzhener.

Dam built of corse fragmental soils. Nov.tekh.i pered.op. v stroi. 18 no.12:19-21 D '56. (MLRA 10:1)

(Dams)

IBRAGIMOV, M.I., Cand Tech Sci -- (diss) "Erection of rolled dams from ~~coarse uncoherent~~ coarsely clastic soils." Tashkent, 1958, 22 pp with illustration (Min of Higher Education USSR. Central Asian Polytechnic Inst) 156 copies (KL, 27-58, 109)

98-58-4-5/18

AUTHOR: Ibragimov, M.I., Engineer

TITLE: Packing of Mixed Filler Earth by Means of Different Packing Equipment (Uplotneniye krupnooblomochnykh gruntov razlichnym uplotnyayushchim oborudovaniyem)

PERIODICAL: Gidrotekhnicheskoye Stroitel'stvo, 1958, Nr 4, pp 21-25 (USSR)

ABSTRACT: Dams in mountainous regions are usually made of mixed filler (including dirt, sand, clay, rock, gravel, etc), locally available. The properties of mixed filler as building material for dams have been sufficiently examined, but not so the methods of consolidating the ground made from mixed filler by using various equipment. On the occasion of the construction of the Orto-Tokoy water reservoir ground packing was done by rollers, tampers and vibrating weight rammers. The packing effect of vehicles on the ground, such as tractors, trucks was also examined (see table 1). The ground at Orto-Tokoy was rolled down with 25 ton roller D-220 attached to two tractors S-80 (see figure 2). As can be seen from table 2 the ground is practically settled (stable) after six passages of the roller. The porosity of the ground was then equal to 14%. It is inadvisable to use rollers fitted with pegs,

Card 1/2

Packing of Mixed Filler Earth by Means of Different Packing Equipment

D-103 A, which are likely to loosen the hard rolled surface. Roller D-263 equipped with pneumatic tires is to be recommended. With the aid of excavator E-258 the ground was tamped down by means of 1,125 kg plate-shaped weight. The results of this method are illustrated by curves in diagram Nr 4. As this method of packing is expensive and slow it should only be applied in places inaccessible to rollers. Ground packing by means of vibrating-weight rammers is very effective and achieves constant density down to a considerable depth. To obtain best results, the soil should contain 10% moisture instead of 6-8%. By this method a density of 2.2 ton-cbm volume weight was achieved and a porosity of 17%. (See table 3 for further details). Tractors and trucks used for transportation of material on the construction site contribute largely to ground packing. Thus tractor S-80 after passing 10 times over the same strip containing mixed filler brought about an increase of density equal to 2.02-2.04 gr/cbcm) Results of these tests are shown in table 4. There are 4 tables and 4 figures.

AVAILABLE: Library of Congress

Card 2/2

1. Dams-Construction 2. Earth moving equipment 3. Construction-Equipment

IBRAGIMOV, M.I.

Analytic theory of increasing continued fractions. Trudy Sam. Gos. un. no.144:119-131 '64.

Metric theory of increasing continued fractions. Ibid.:133-146 (MIRA 18:9)

IBRAGIMOV, M.I.

Some properties of finite nonmetabelian P-groups, all subgroups of which are metabelian. Trudy Nauch.ob!ed.prep. fiz.-mat. fak.ped.inst. Dal'.Vost. 1:75-81 '62. (MIRA 17:3)

IBRAGIMOV, M.Kh.

Phosphate nutrition of the cotton plant. Trudy SAGU no.53:141-148 '54. (MLRA 9:11)

(Cotton) (Phosphates)

: [illegible]

ABS.JOUR. : RZhBiol., No.4, 1959,

AUTHOR : Ibragimov, M.K. No.15708

INST. : Dagestan Sci.Res.Inst. of Agric.

TITLE : Harvest Dates of Sudan Grass for Seed and Hay

CITED.WORK. : Byul. nauchno-tekhn. inform. Dagestansk. n.-i. in-ta s. kh., 1957, No.1, 34-40

ABSTRACT : The research was done in irrigated lands of the institute's experimental base. The phase of the beginning of head forming was determined as the best date for harvesting sudan grass for hay, as this harvest date secures the greatest yield of nutritive substances per hectare. In 1955 with harvesting at the beginning of head formation 82.88 centner/hectare of hay was reaped in four mowings, with harvesting in the flowering phase 86.27 c/h was reaped in three mowings.

CARD : 1/2

ABS.JOUR. : RZhBiol., No.4, 1959, No. 15708

TITLE :

ABSTRACT : The crop of protein amounted to 11.33 and 8.09 c/h respectively. In comparison with the seed crop reaped from first mowings, that obtained from second mowing proved higher on the average for two years - by 1.6 c/h of seed and 58.75 c/h of green mass. The seed from the second mowing had better sowing qualities than the seed from the first mowing.
-- N.B. Borisova

CARD : 2/2

IBRAGIMOV, M. K.: Master Agric Sci (diss) -- "The basic procedures in the production of sudan-grass seed under the irrigated conditions of Dagestan". Makhachkala, 1958. 20 pp (All-Union Sci Res Inst of Fodder im V. R. Vil'yams), 180 copies (KL, No 5, 1959, 153)

IBRAGIMOV, M.Kh.

Changes of pH and Eh in cotton seeds soaked in water. Uzb.biol. zhur. no.6:26-31 '61. (MIRA 15:2)

1. Tashkentskiy gosudarstvennyy universitet imeni V.I.Lenina.
(Cottonseed) (Germination)

IBRAGIMOV, M.Kh.

Exosmosis of substances from cotton seeds in the process of soaking. Uzb. biol. zhur. 6 no.1:21-26 '62. (MIRA 15:3)

1. Tashkentskiy gosudarstvennyy universitet imeni V.I. Lenina.

(COTTONSEED)

21.1200,24.5200

77218
30V/89-8-1-12/29

AUTHORS: Ibragimov, M. Kh., Subbotin, V. I., Ushakov, P. A.

TITLE: Investigation of Heat Irradiation During Turbulent Flow of Heavy Metals Through Pipes. Letter to the Editor

PERIODICAL: Atomnaya energiya, 1960, Vol 8, Nr 1, pp 54-56 (USSR)

ABSTRACT: Two setups were used, one for mercury and the other for lead and an eutectic alloy of lead and bismuth (43.5% Pl + 56.5% Bi). Experiments with mercury. The 99.9% pure mercury R-3 was sent through a suede filter. It circulated in the apparatus through a countercurrent heat exchanger of 17 x 12.5 mm tube diameter made of stainless steel 1Kh18N9T. Water circulated in the annular space 4.5 mm wide, and the useful heat-exchange region was 760 mm long. A region of hydrodynamic stabilization equal to 40 diameters was provided at the entrance to the heat exchanger. Auxiliary heaters on both ends prevented escape of heat along the tube, and the temperature at both ends was measured by thermocouples. The

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heat transfer was then determined in the usual way. The arithmetic average of the thermocouple temperature was used as the average mercury temperature while the average temperature on the heat-exchange surface was obtained after planimeter measurements of the temperature profile along the exchanger. Correction was made for the depth of the build-in of the thermocouples. Lead and lead-bismuth alloy experiments. Argon was used to prevent oxidation of the liquid metal, previously purified from oxides by hydrogen reduction. Chemical analysis showed that during the experiment the oxygen content was practically constant at $1 \cdot 10^{-3}$ % weight. The tube was of 12 x 9 mm diameter of stainless steel 1KH18N9T, with a brouched inner surface. Temperature was measured using a resistance thermometer of platinum wire 0.07 mm in diameter, 1800 mm long and taped every 118 mm. The thermometer was 33 diameters away from the origin of the heating region. Liquid metal temperature at the entrance was also measured

with a resistance thermometer while the heat carrier temperature was determined using a chromel-alumel thermocouple. The discharge of the liquid metal was determined using a previously calibrated magnetic flowmeter. The heat flow was produced by electric heating. The length of the heat-exchange region was 520 mm. Experimental results. The average heat exchange coefficient of mercury was determined in a region of the heat exchanger equal to 60 diameters. The section of preliminary hydrodynamic stabilization was equal to 40 diameters, while the lead and lead-bismuth alloy measurements refer to a region 33 diameters from the origin of the heated region and 41 diameters from the entrance into the tube. The results are, therefore, in the stable region. The limits of variation for some of the pertinent quantities are given in the table.

...vestigation of Heat Irradiation During Turbulent Flow of Heavy Metals Through Pipes. Letter to the Editor

The figure shows the experimental results together with the curves obtained from an empirical equation developed by Mikheyev and others (Ref. 1, M. A. Mikheyev, V. A. Baum, K. D. Voskresenskiy, O. S. Fedynskiy, Reactor Construction and Theory, Izdat AN SSSR, 1955, p 139).

$$Nu = 4{,}5 + 0{,}014 Pe^{0{,}8} \qquad (1)$$

and the semiempirical equation by Lyon

$$Nu = 7 + 0{,}025 Pe^{0{,}8}. \qquad (2)$$

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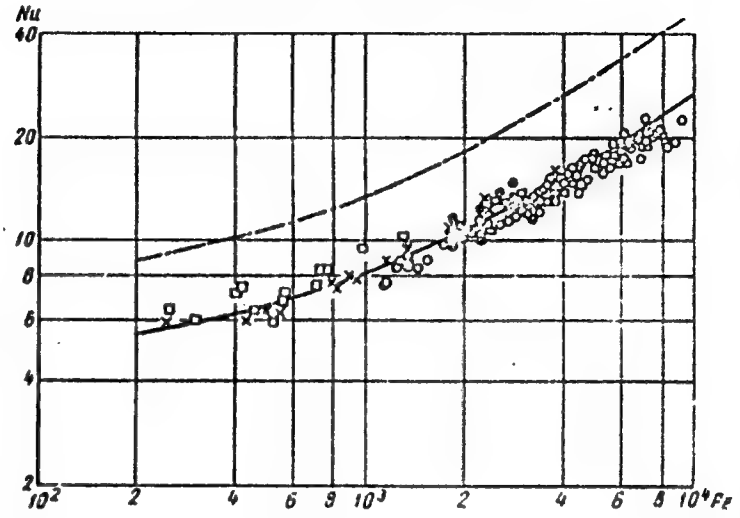
Experimental results processed utilizing similarity criteria:

o - mercury; • - lead; □ - eutectic alloy lead-bismuth; x - eutectic alloy lead-bismuth with the addition of 0.1% magnesium; —— - according to the equation in reference [1] (above $Nu = 4.5 + 0.014\ Pe^{0.8}$; — · — · — · — according to the equation by Lyon, $Nu = 7 + 0.025\ Pe^{0.8}$.



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The results agree with the Eq. (1) probably because the liquid metals were not purified during the experiment, and the heat-exchanging surface was not subjected to moistening. One can then assume that under such conditions there existed a thermal resistance which led to disagreement with the curve obtained by using Eq. (2). In later experiments the authors determined the temperature field inside the flow of liquid metal. Computing the coefficients of heat irradiation by extrapolating the temperature profile all the way to the walls, they obtained results in agreement with Eq. (2). Kh. A. Khachaturov, A. A. Sholokhov, V. I. Petrovichev, Ye. V. Nomofilov, and O. V. Remizov took part in building equipment and collecting experimental data. There is 1 figure; and 8 references, 5 Soviet, 1 U.K., 2 U.S. The U.K. and U.S. references are: H. Brown, B. Amstead, B. Short, Trans. ASME, 79, 279 (1957); R. Lyon, Chem. Engng. Progr., 47, 25 (1951); S. Isakoff, T. Drew, General Discussion on Heat Transfer,

Card 7/8

24.5200

78328
SOV/89-8-3-13/32

AUTHORS: Subbotin, V. I., Ibragimov, M. Kh., Ivanovskiy, M. N.

TITLE: Turbulent Temperature Pulsations in a Flow of Liquid. Letter to the Editor

PERIODICAL: Atomnaya energiya, 1960, Vol 8, Nr 3, pp 254-257 (USSR)

ABSTRACT: Pulsations of velocity of a turbulent flow of liquid cause turbulent temperature pulsations during heat exchange. The authors investigated the effect using movable thermocouples of low heat capacity. One type consisted of an open junction 0.2 mm in diam and the other of a junction inside a thin-walled container 0.5 or 0.8 mm in diam. One construction is described in detail by Kirrillov and others (Atomnaya energiya, 6, Nr 4, 382 (1959)). The heat flow was produced by means of electrical heating elements. The thermocouple data were registered by means of fast automatic potentiometers EPP-09 Class 0.5, covering the whole scale, 0 to 0.5 mv, in 1 sec. Results are shown on Fig. 1 and 2.

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Turbulent Temperature Pulsations in a Flow of Liquid. Letter to the Editor

78328
SOV/89-8-3-13/32

Typical liquid metal time curve of pulsation is shown in Fig. 3. Similar results were obtained in water. The authors found that the amplitude and frequency of temperature pulsation depend on the size of the heat flow, the physical properties, the type of flow of the liquid, and on the dimensionless distance from the wall. Temperature pulsations inside the wall were damped as one leaves the heat exchange region. It was established that pulsations persist some 2-5 sec after the end of heating and then start slowly to dampen out. The reverse happens after switching the heat on. The pulsations accompany the existence of a temperature gradient in the liquid. Various methods of pumping had no influence on the pulsations. Likewise, the frequency of the heater current and 3% fluctuations of the heating power did not produce any change in the pulsation pattern. The authors took care to eliminate all possible causes of mechanical vibrations, and they are sure that the measured temperature oscillations are due to the turbulent pulsations of the temperature

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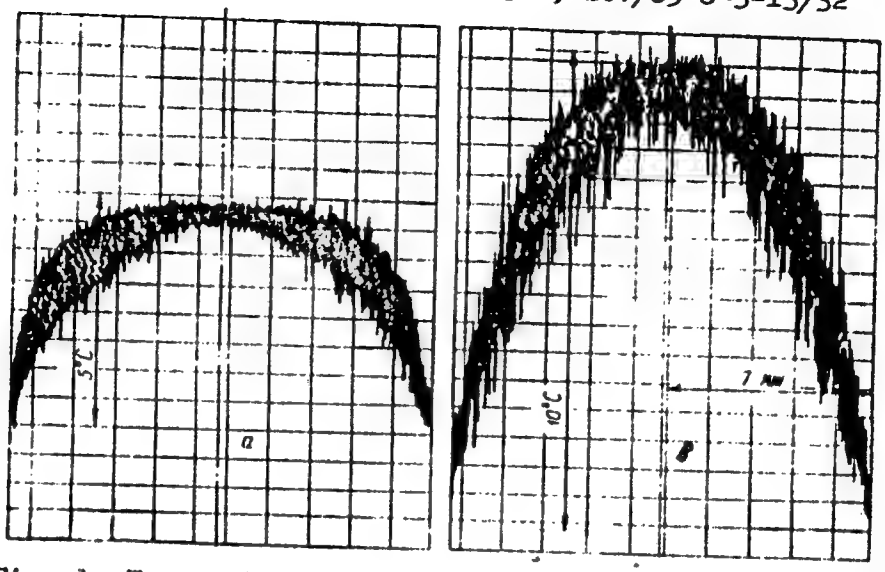

Fig. 1. Temperature profile in liquid metal flow: (a) Re = 230,000; q = 50,000 kcal/m^2·h; (b) Re = 30,000; q = 20,000 kcal/m^2·h.

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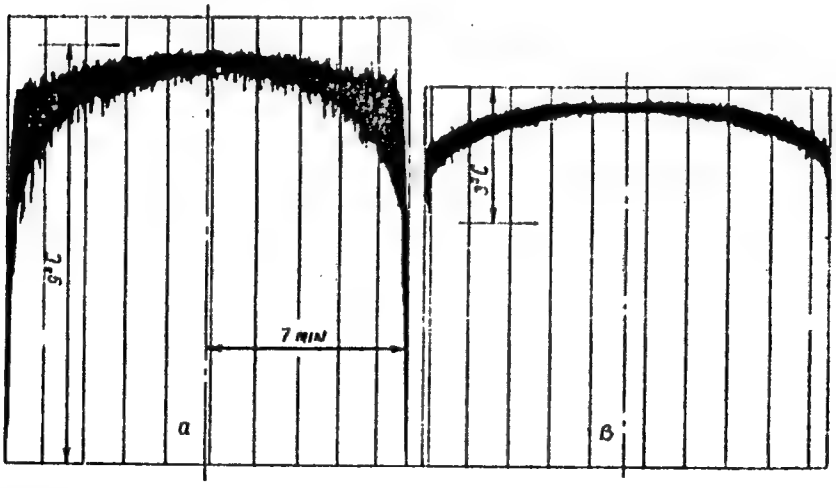

Fig. 2. Temperature profile in water flow: (a) Re = = 8,900; q = 30,000 kcal/m^2·h; (b) Re = 35,000; q = 50,000 kcal/m^2·h.

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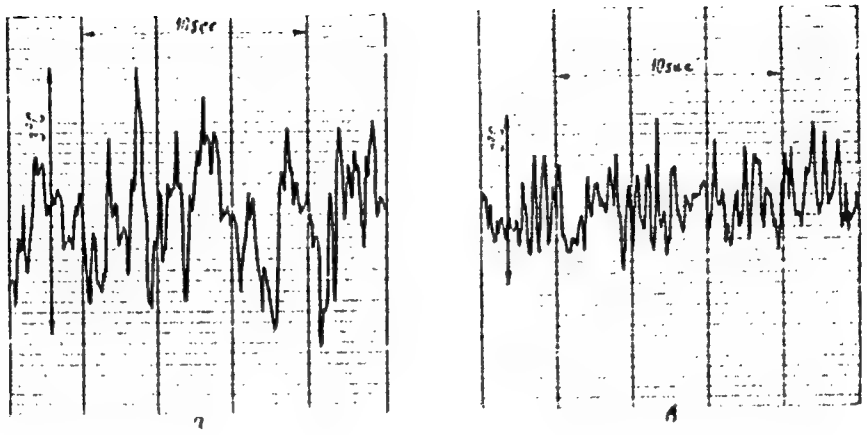

Fig. 3. Time curve of temperature pulsation of a flow of liquid metal in region of maximum amplitudes: (a) Re = = 30,000; q = 20,000 kcal/$m^2 \cdot h$; (b) Re = 230,000; q = 50,000 kcal/$m^2 \cdot h$.

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in the flow. The amplitude variations with radius observed on Figs. 1 and 2 agree with the hypothesis that the magnitude of turbulent temperature pulsation is proportional to the mixing path length l and the temperature gradient, except that the pulsations differ from zero even in the center of the tube and on its walls. Thermocouples used were able to react to frequencies up to 100 cycles/sec without amplitude distortion. The registering device could follow up to 20 c/sec. The frequencies registered in these tests obviously did not represent the whole spectrum of temperature pulsations, and the authors plan to continue investigations using still more perfected instruments with small thermal inertia. Ye. V. Nomofilov, M. N. Arnol'dov, and Yu. N. Pokrovskiy helped build the experimental apparatus and took part in measurements. A. I. Leypunskiy and A. P. Aleksandrov gave advice and showed interest in the work. There are 4 figures; and 2 Soviet references.

SUBMITTED: October 12, 1959
Card 6/6

IBRAGIMOV, M. K., IVANOVSKIY, M. N., ARNOL'DOV, M. N., NOMOFILOV, Ye. M., and SUBBOTIN, V. I.

"Heat Emission and Turbulent Heat Transfer in a Flow of Liquid Metals."

Report submitted for the Conference on Heat and Mass Transfer, Minsk, BSSR, June 1961.

SUBBOTIN, V.I.; IBRAGIMOV, M.Kh.; IVANOVSKIY, M.N.; ARNOL'DOV, M.N.; NOMOFILOV, Ye.V.; ATENKOV, S., tekhn. red.

[Heat transfer and turbulent heat transport in a flow of luquid metals; Conference on Heat and Mass Transfer, Minsk, January 23-27, 1961] Teplootdacha i turbulentnyi perenos tepla v potoke zhidkikh metallov; soveshchanie po teplo-i massoobmenu, g. Minsk, 23-27 ianvaria 1961 g. Minsk, 1961. 18 p. (MIRA 15:2)
(Heat--Transmission) (Liquid metals)

29918
S/594/61/000/000/006/011
D234/D303

26.5000 (also 1498)

AUTHORS: Subbotin, V.I., Ibragimov, M.Kh. and Nomofilov, Ye.V. (Moscow)

TITLE: Measuring turbulent pulsations of temperature in a stream of liquid

SOURCE: Soveshchaniye po teplo- i massoobmenu. Minsk, 1961. Tezisy dokladov i soobshcheniy (Dopolneniye), 38-39

TEXT: Turbulent pulsations of temperature in the flow of liquid metal and water in a pipe were measured. The amplitude of temperature pulsations obey Gauss Law of Normal Distribution. A variation of the amplitude of the pulsations with the radius was detected which, in the range of maximum amplitudes, agrees with the hypothesis that the magnitude of the pulsations is proportional to the length of the path of mixing and to the gradient of the averaged temperature field. At all points of the turbulent stream the intensity of the pulsation decreases with the increase of the num-

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Measuring turbulent pulsations...

ber Re. Mean frequency of the pulsations varies little with the cross section of the stream. Temperature pulsations were found in the layer at the wall of the pipe and in the wall. It is shown that the thickness of the layer at the wall varies continually in an accidental manner, but the layer does not disappear completely. If there is stationary cooling the process of heat transfer through the layer at the wall and the surface of heat exchange is quasi-stationary. Increase of mean frequency of the pulsations in the wall and in the stream was found from zero values (Re < 2000) to approximately 1 cycle (for Re $\simeq$ 2300) which indicates that a turbulent regime of flow appears. [Abstracter's note: Essentially a complete translation]

Card 2/2

29919
S/594/61/000/000/008/011
D234/D303

26.5000 (also 1498)

AUTHORS: Subbotin, V.I., Ibragimov, M.Kh., Ivanovskiy, M.N., Arnol'dov, M.N. and Homofilov, Ye.V. (Moscow)

TITLE: Heat loss and turbulent heat transfer in streams of liquid metals

SOURCE: Soveshchaniye po teplo- i massoobmenu. Minsk, 1961. Tezisy dokladov i soobshcheniy (Dopolneniye), 39-41

TEXT: Coefficients of heat loss and turbulent heat transfer were determined on the basis of measuring temperature fields in streams of various alkaline and heavy liquid metals. The liquid metals investigated have a sufficiently wide range of measurement [Abstracter's note: "izmereniye" - probably a misprint of "izmeneniye" - change, variation] of the criterium Pr = 0.005 ÷ 0.05. Several experiments with measurement of temperature fields were made on water. Turbulent pulsations of temperatures in the stream were found, whose magnitude was up to ± 20% of the value of tempera-

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ture stress. It was found that the amplitude and frequency of the pulsations depend on the magnitude of heat flow, physical properties, regime of flow of the liquid and dimensionless distance from the wall. Temperature pulsations of the liquid near the wall and of the wall itself indicate that the process of heat transfer through the layer of liquid at the wall and the surface of heat exchange is not rigorously stationary. The values of Nu obtained by processing the measurement data of temperature fields in streams of various liquid metals are in good agreement with one another and with the results of previous investigations. Coincidence of the experimental data with Lyon's formula

$$Nu = 7 + 0.025\ Pe^{0.8} \qquad (1)$$

is observed in a sufficiently wide range of the number Pe = 100 ÷ 12,000. However, this is not an indication of the unconditional correctness of Lyon's assumption that the ratio of the coefficients of turbulent heat transfer and quantity of motion $\varepsilon = \varepsilon_q/\varepsilon_\nu$ does not vary across the section of the pipe and is equal to 1 for all

values of the number Pe. Data processing on temperature fields obtained showed that the above ratio varies with the radius of the pipe and depends on the criterium Re. The coefficient of turbulent heat transfer was determined from

$$\varepsilon_a = \frac{q/q_w}{\frac{\partial t}{\partial \xi}} \frac{r_0 q_w}{c_p \gamma} - a \qquad (2)$$

The ratio of local heat flow and the flow at the wall was found from a relation obtained from the heat balance of an elementary volume of the liquid. In several experiments the coefficient of heat loss was determined by the same methods, in which the thermal contact resistance on the surface of heat exchange was taken into account. The experiments allowed the authors to make a sufficiently clear distinction between two processes which determine the heat transfer to liquid metals. The first process, connected with molecular and turbulent heat transfer, can be described by semi-empirical theories of heat exchange. Such heat transfer is described in

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the first approximation by the Martinelli-Lyon theory. The second process, caused by thermal contact resistance on the surface of heat exchange, defies theoretical estimation at present. [Abstracter's note: Complete translation]

Card 4/4

23556

S/096/61/000/007/004/006
E194/E155

21.4240

AUTHORS: Ibragimov, M.Kh., Candidate of Technical Sciences, Nomofilov, Ye.V., Engineer, and Subbotin, V.I., Doctor of Technical Sciences.

TITLE: Heat transfer and hydraulic resistance during helical motion of a fluid in a tube

PERIODICAL: Teploenergetika, 1961, No. 7, pp. 57-60

TEXT: This article describes the influence of the additional turbulence caused by helical motion of fluid in a tube. The tests were carried out with water ($Pr > 1$) and liquid metal ($Pr \ll 1$) which were of different thermal conductivity. Measurements were made both of heat transfer and hydraulic resistance. The resistance tests were made in a tube of steel 1Kh18N9T (1Kh18N9T) of 12 mm internal diameter, 1020 mm long, with an internal finish of class 5. Into this were inserted twisted strips of metal to cause the helical flow. Tests were made with helix pitches of 50.5, 109.5 and 238 mm and with a flat central strip. Resistance-test results are plotted in Fig.1, in which the black points (1) correspond to a pitch of 50.5 mm and the circles (2) to the other

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two pitches and the straight strip. It will be seen that the resistance rose sharply as the helix pitch dropped below 109.5 mm. The heat-transfer tests were made in a tube of steel 1Kh18N9T with an internal diameter of 12 mm and a test portion 680 mm long. The latter was enclosed in a ceramic tube wound with an electric strip heater. The internal twisted strips tested had pitches of 50.5 and 109.5 mm, and a flat strip was also used. Heat-transfer test results with water are plotted in Fig.4, where the experimental points (1) correspond to a pitch of 50.5 mm, points (2) to 109.5 mm, points (3) to a flat strip and points (4) to the tube without any strip. The influence of the twisted spiral on heat transfer with water may be allowed for by introducing a correction factor K_T into Mikheyev's formula

$$Nu = 0.021\ Re^{0.8}\ Pr^{0.43}\left(\frac{Pr_{ct}}{Pr_{\mu}}\right)^{0.25} K_T \qquad (4)$$

The correction factor K_T is given by the following expression:

$$K_T = 1 + A\left(\frac{d_{BH}}{s}\right)^{n} \frac{1}{Re^{m}} \qquad (5)$$

where: d_{BH} is the internal diameter; s is the pitch; and for values

$$0 \leq \frac{d_{BH}}{s} \leq 0.25 \quad \text{and} \quad 10^4 \leq Re \leq 4 \times 10^4,$$

$$A = 1.13 \times 10^5; \quad n = 1\varphi \quad m = 1.2$$

For tubes alone and with untwisted strips, $K_T = 1$. Formula (4) gives satisfactory representation of the experimental results for water. The results for liquid metal worked out in terms of the Nu and Pe criteria are plotted in Fig.6. The two curves correspond to the upper and lower ranges of heat-transfer coefficients published for liquid metals. In Fig.6, points (1) correspond to a pitch of 50.5 mm, points (2) to a pitch of 109.5 mm, points (3) to a straight strip, and points (4) to a tube without strip. It will be seen that in the case of liquid metal which is a good conductor of heat the increased turbulence due to helical flow has no appreciable influence on the heat transfer.
There are 6 figures, 1 table and 4 references: 3 Soviet and 1 English. The English language reference reads as follows:
Ref.3: R.N. Lyon. Chem. Eng. Progr. Vol.47, No.2, 1951.
Card 3/5

11, 9200

AUTHORS: Subbotin, V. I., Ibragimov, M. Kh., Ivanovskiy, M. N., Arnol'dov, M. N., Nomofilov, Ye. V.

TITLE: Turbulent heat transfer in a flow of liquid metals

PERIODICAL: Atomnaya energiya, v. 10, no. 4, 1961, 384-386

TEXT: The modern theory of turbulence does not permit an analytic determination of a turbulent heat transfer in a flow of liquid matter. As shown by the present study, the semi-empirical theory of heat transfer which makes use of the analogy of heat transfer and momentum transfer, makes it possible to perform such studies. This can be proved by measuring the temperature fields in liquid metals. On account of the high thermal conductivity of liquid metals, the temperature drop is not limited to a thin, laminated layer like in ordinary liquids but extends to the turbulent core. Martinelli was the first to apply the theory of hydrodynamical analogy to liquid metals, taking into account the molecular heat conductivity in the turbulent core of the flow. Calculations were based on the assumption that the ratio of the coefficients of turbulent heat transfer

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Turbulent heat...

and of momentum transfer ($\varepsilon_a/\varepsilon_\nu$) were independent of the radius and the flow velocity. Lion has derived a general equation for the heat-transfer coefficient in a tube:

$$\frac{1}{Nu}=2\int_0^1 \frac{\left[\int_0^1 \frac{u}{w}\xi d\xi\right]^2}{\left(1+\varepsilon\frac{\varepsilon_\nu}{\nu}Pr\right)\xi}d\xi. \qquad (1)$$

where $\xi = r/r_0$ and, using the results of Martinelli with $\varepsilon = \varepsilon_a/\varepsilon_\nu = 1$, he obtained $Nu = 7 + 0.025\,Pe^{0.8}$. Martinelli's and Lion's assumption that $\varepsilon = 1$ has not yet been confirmed experimentally. Voskresenskiy, Deissler, Jenkins et al. have found experimentally that ε was much smaller than 1. On the basis of measurements of the temperature fields in flowing water and flowing liquid metals, the authors have made an attempt to determine the turbulent heat-transfer coefficient and ε for liquid metals, and to study the effect of the thermal conductivity of the metals on these quantities. The former quantity was calculated from the equation

$$\varepsilon_a = \frac{q/q_0}{\partial t/\partial\xi}\frac{r_0 q_0}{c_p\gamma} - a \qquad (3).$$

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Turbulent heat...

The ratio of the local heat flow to the heat flow on the wall was found from the equation

$$q/q_o = \frac{1}{\xi}\frac{u^*}{w}\left[(4.25 + 2.5 \ln y^+)\xi^2 - 2.5\xi - 2.5(1 - \xi^2)\ln(r_o/y)\right].$$

The temperature gradients determined by graphical methods make it possible to calculate ε_a from Eq. (3). Fig. 1 shows the distribution of ε_a across the tube cross section. ε_a grows with increasing distance from the wall and with increasing Re number, wherefrom it follows that $\varepsilon_a \neq 0$ in the center of the tube. The curves shown in Fig. 1 hold for a heavy metal. The $\varepsilon_a(\xi)$ curves taken for alkaline metals show a similar course, but the maximum is hardly marked at high Re numbers. Fig. 2 shows the experimental curves $\varepsilon_a/\varepsilon = f(\xi)$ (continuous lines) as compared with those calculated according to Lion (-·-·-·) and those obtained for heavy metal (A) and alkaline metal (B) according to Voskresenskiy (-----). A comparison between measured and theoretically determined temperature fields (Fig. 3) shows that the assumption $\varepsilon = 1$ increases the influence of turbulent heat transfer at small Re numbers but reduces it at high Re numbers. According to the Re number, ε is thus higher or lower than 1.

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Turbulent heat... S/089/61/010/004/016/027
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Fig. 4 shows $\varepsilon = f(Re)$ at $\xi = 0.8$ for water (•), alkaline metal (⊙), and heavy metal (○). There are 4 figures.

SUBMITTED: July 14, 1960

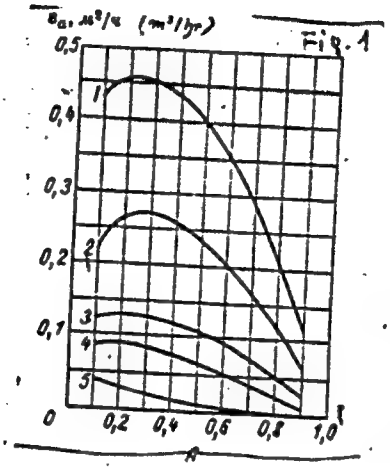

Fig. 1

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B102/B201

215240

AUTHORS: Subbotin, V. I., Ibragimov, M. Kh., Ivanovskiy, M. N., Arnol'dov, M. N., Nomofilov, Ye. V.

TITLE: Heat transfer with a turbulent flow of liquid metals in tubes

PERIODICAL: Atomnaya energiya, v. 11, no. 2, 1961, 133-139

TEXT: This is a report on a study of heat transfer occurring with a turbulent flow of liquid alkali and heavy metals in tubes. In the range of $Pe = 10^2$-10^4, experimental data on heat transfer to liquid metals differ considerably; they may, on the whole, be grouped into two classes which are characterized by $Nu = 7 + 0.025\ Pe^{0.5}$ (1) and $Nu = 3.3 + 0.014\ Pe^{0.8}$ (2). The authors determined the heat-transfer coefficients by two methods: by measuring the temperature field in the flow of liquid metal, and by measuring the wall temperature and the mean temperature of the liquid metal. Fig. 1 shows the experimental setup traversed by the metal vertically (from bottom to top). The characteristics of the experimental setup are as follows:

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Heat transfer with a turbulent ...

	Part 1	Part 2
tube material	steel 1Kh18N9T (1Kh18N9T)	steel 1Kh18N9T (1Kh18N9T)
outer tube diameter	42 mm	34 mm
inner tube diameter	31.1 mm	29.3 mm
distance between tube inlet and thermocouple	1166 mm	985 mm
length of part with heat transfer	1194 mm	980 mm
distance between beginning of heated part and thermocouple	976 mm	945 mm

All thermocouples (chromel-alumel couples) that served to measure the temperature of the liquid metal at the inlet and outlet of the test tubes, were calibrated on a platinum - platinum rhodium thermocouple. The electric power was measured by astatic wattmeters of accuracy index 0.2 and 0.5. The flow rate of the metal was measured by magnetic and throttle flow meters. The alkali metals were continuously purified from oxides (oxygen content 0.02-0.005% by weight), not so the heavy metals (oxygen content

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Heat transfer with a turbulent ...

$\sim 10^{-3}$% by weight). The temperature in the flow was measured with mobile thermocouples on 9-12 fixed points. Special small-size thermocouples served to measure the temperature fields; the results of these measurements were in good agreement with those calculated by Lyon's theory. The wall were in good agreement with those calculated by Lyon's theory. The wall temperature was determined by extrapolation of the temperature profile for the wall. The mean temperature of the flowing liquid metal was calculated from the formula $t_{liq} = \int_0^r Ut_{liq} rdr / \int_0^r Urdr$, where $U^+ = 5.5 + 2.5 \ln$, y^+ was taken as the velocity-distribution law; ($y = 0.25$-0.4 mm). The Nusselt numbers resulting from the measurement of the temperature fields are in good agreement both with one another and with the results of other authors. They are consistent with Lyon's formula (1) in the range $Pe = 100$-$12{,}000$. It is not, however, as assumed by Lyon, $\varepsilon_a/\varepsilon_\nu = 1$, constant over the tube cross section, and independent of Pe, but radically variable, and smaller than unity for small Pe, larger than unity for large Pe. The second method takes account of the thermal contact resistance on the heat-transfer surface. The results obtained by the two methods are in

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Heat transfer with a turbulent,... S/089/61/01·/002/004/015
B102/B201

agreement for alkali metals, which is indicative of the fact that there is no thermal contact resistance in them under the given conditions (purification from oxides!). No agreement was found in the case of heavy metals, i.e., there is a thermal contact resistance at the interface between tube wall and liquid metal. As was shown by further studies, this contact resistance drops exponentially with a rise of Re. Yu. N. Pokrovskiy, Engineer, and A. P. Aleksandrov, laboratory assistant, helped to prepare the experimental setup and the small-size thermocouples. There are 6 figures, 1 table, and 12 references: 6 Soviet-bloc and 6 non-Soviet-bloc. The three most important references to English-language publications read as follows: R. Lyon, Chem. Engng. Progr. 47, 2, 75 (1951); H. Brown et al. Trans. ASME, 79, No. 2, 279 (1957); R. Martinelli. Trans. ASME, 69, No. 8, 947 (1947).

SUBMITTED: August 25, 1960

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S/096/62/000/003/006/008
E195/E484

26.5200

AUTHORS: Subbotin, V.I., Doctor of Technical Sciences,
Ibragimov, M.Kh., Candidate of Technical Sciences,
Nomofilov, Ye.V., Engineer

TITLE: Measurement of turbulent temperature pulsations in a fluid stream

PERIODICAL: Teploenergetika, no.3, 1962, 64-67

TEXT: Experimental study of turbulent temperature pulsations provides a better understanding of the internal structure of the stream and the mechanism of heat transfer under turbulent flow conditions. The test fluids were water and liquid metal; the apparatus is described. The authors established that with a variation in the Reynolds number there was a change in the temperature profile and the amplitude of pulsations and that the characteristic of temperature pulsations, in the region of maximum amplitudes, was the same for both fluids tested, although their thermal conductivities differed by a factor of 20 or 30. There was also a noticeable difference between the

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flow (Fig.3). Thus the maximum value of intensity of temperature pulsations must be in the Re region of 2300 to 20000, since pulsations do not occur in laminar flow. In addition to the temperature pulsations in the turbulent core of the stream, there are also pulsations in the immediate proximity of the wall, in the laminar layer and in the pipe wall itself. The variation in mean frequency of temperature pulsations, in fluid stream and pipe wall, with a change in Re number, is also given. There are 8 figures and 5 references: 4 Soviet-bloc and 1 Russian translation from non-Soviet-bloc publication.

SUBBOTIN, V.I.; IBRAGIMOV, M.Kh.; NOMOFILOV, Ye.V.

Heat transfer in the thermal stabilization region during turbulent flow of liquid metals in a tube. Atom. energ. 13 no.2:155-161 Ag '62. (MIRA 15:8)

(Hydrodynamics) (Heat—Transmission)

L 12924-63 EPR/EPF(c)/EPF(n)-2/EWT(l)/EWP(q)/EWT(m)/BDS ASD/AFFTC/SSD
Pr-4/Pu-4/Ps-4 WW/JD
ACCESSION NR: AP3000684 S/0096/63/000/006/0070/0074 75

AUTHOR: Subbotin, V. I. (Doctor of technical sciences); Ibragimov, M. Kh. (Candidate of technical sciences); Nomofilov, Ye. V. (Engineer) 74

TITLE: Measurement of temperature fields in turbulent flow of mercury in a pipe 27

SOURCE: Teploenergetika, 10 no. 6, 1963, 70-74

TOPIC TAGS: turbulent heat transfer coefficient, radial temperature profile

ABSTRACT: Radial temperature profiles in mercury flowing upward in a vertical tube of 1Kh18N9T steel (outer diameter, 34 mm; inner diameter, 29.3 mm; length, 1300 mm) were determined by a moving temperature probe equipped with two alumel-chromel thermocouples. The tube was heated by a nichrome strip and the probe was driven by a worm gear mechanism with an electric motor. The experimental parameters were as follows: Re, 19,300—410,000; average mercury temperature, 10.1—41.1C; temperature difference between the mercury and the tube wall, 3.2—6.3C; and flow velocities, 0.08—1.72 m/sec. Measurements were made at 12 points located 0.25—14 mm from the tube wall. The temperatures were recorded for 30—50 sec by an EPP-09 high-speed automatic potentiometer, and the average readings were plotted on a dimensionless temperature versus distance graph.

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L 12924-63
ACCESSION NR: AP3000684

The wall temperature was obtained by extrapolation of the profiles. The turbulent heat transfer coefficient (ε_a) was calculated from the local heat fluxes, the heat flux through the wall, and the temperature gradients obtained from the profiles by graphical differentiation. The value of ε_a increased with increasing Re and with increasing distance from the wall, attaining a maximum at $r/r_0 = 0.2-0.3$. In the center of the tube (r/r_0 is less than 0.2), accurate values of ε_a could not be determined because of the considerable inaccuracy in the temperature gradients. The thermal mixing length was also determined and plotted against the r/r_0. To gain further insight into the heat transfer mechanism, it is suggested that experiments be carried out in which ε_a is determined with sufficient accuracy in the center and the wall zone. Orig. art. has: 5 figures, 3 tables, and 6 formulas.

ASSOCIATION: none

SUBMITTED: 00	DATE ACQ: 21Jun63	ENCL: 00
SUB CODE: NS	NO REF SOV: 003	OTHER: 004

Card 2/2

IBRAGIMOV, M.KH.

AID Nr. 978-4 28 May

RELATIONSHIP BETWEEN TURBULENT HEAT-TRANSFER COEFFICIENTS AND MOMENTUM (USSR)

Subbotin, V. I., M. Kh. Ibragimov, and Ye. V. Nomofilov. Atomnaya energiya, v. 14, no. 4, Apr 1963, 414-416. S/089/63/014/004/016/019

In a study of heat transfer in turbulent flow of liquid metal, the heat-transfer and momentum-transfer coefficients have been calculated from experimental temperature fields obtained with liquid metal flowing in a pipe at Pr = 0.025 and Re = 20,000 to 450,000. The calculations show that 1) the ratio between the coefficients of turbulent heat transfer and momentum depends on the Reynolds number, and 2) the turbulent transfer of momentum and the coefficient of dissimilarity ε between turbulent heat transfer and momentum depend on the flow velocity distribution law. However, the velocity distribution has very little effect on the variation of ε along the pipe radius. It is stated that the turbulent heat-transfer theory can be developed only on the basis of direct experimental study of actual parameters, including velocity pulsations, temperature, and the statistical correlations between the two. [AS]

Card 1/1

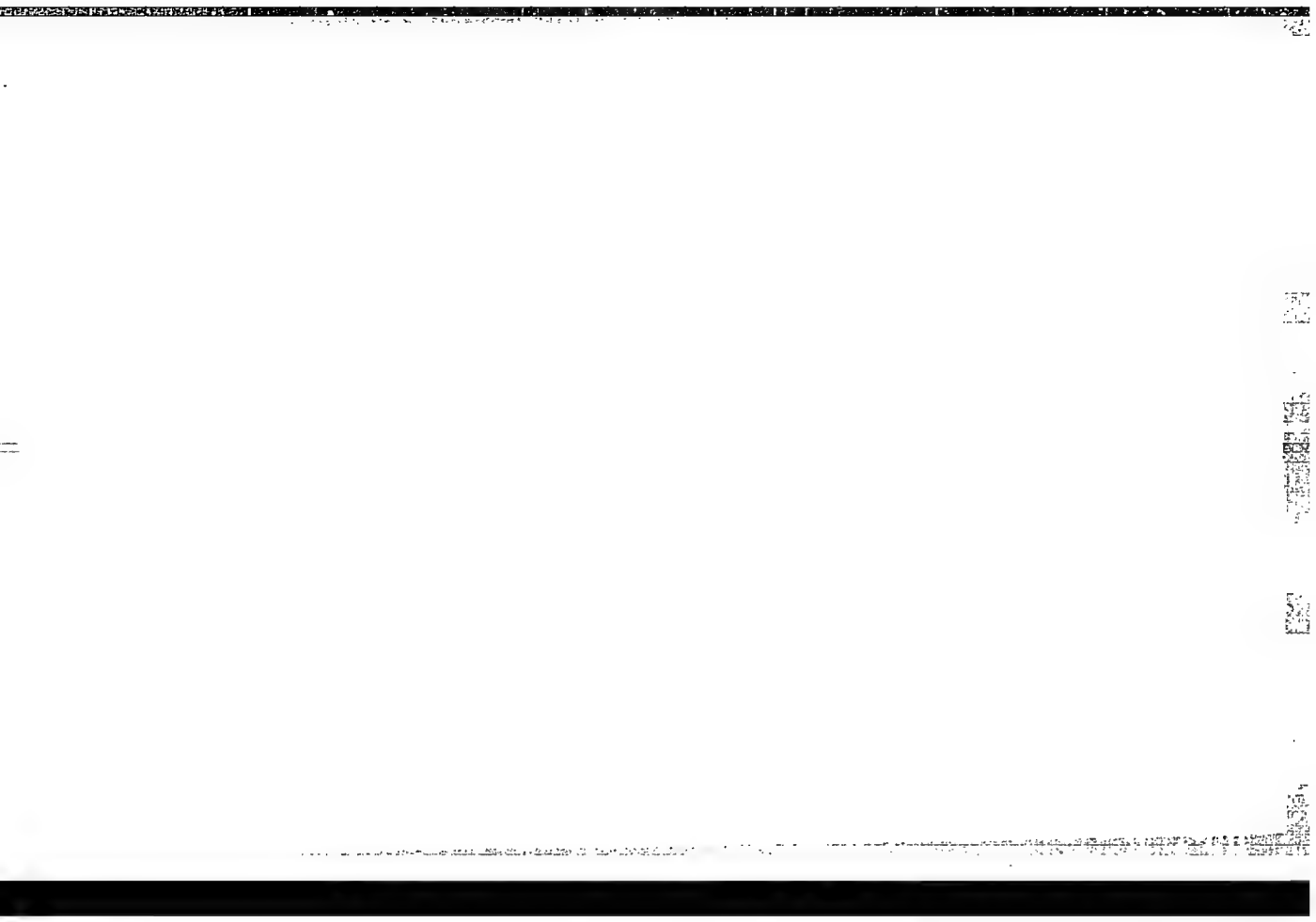
IBRAGIMOV,M.KH.;NOMOFILOV,YE.V.;SUBBOTIN,V.I. (Obninsk)

"Statistical analysis of turbulent temperature pulsation in fluid flow"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 Jan - 5 Feb 64.

SUBBOTIN, V.I. (Moskva); IBRAGIMOV, M.Kh. (Moskva); NOMOFILOV, Ye.V. (Moskva)

Statistical study on turbulent temperature pulsations in a liquid flow. Teplofiz. vys. temp. 2 no.1:71-77 Ja-F '64. (MIRA 17:3)



TITLE: Miniature thermocouples [illegible] atomic electric station

Teploenergetika, no. 5, 1965, [illegible]

[illegible] nuclear power plant.

[illegible] from 0,1-0,2 mm, [illegible]

L 59312-65

ACCESSION NR AP5011777

3

... may have a base of ... the material

... the sheath was of alloy of steel, nickel ... After, capillary ... 1Kh18N9T or OKh18N9T steel are used. ... dimensions are: ... 0.07, 0.5 x 0.1, 0.6 x 0.15, 0.8 x 0.15, 1.0 x 0.2, 1.4 x 0.2, or 1.5 x 0.3 mm. The thermocouples may be divided into the following categories: 1) those without a ... 2) those with ... protective coating; 3) those with a limited length of protective coating; ... having a hermetically sealed sheath. One of the considerations in

... 10^20 ... It was found that under these conditions)

... NP, TD

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00051832(

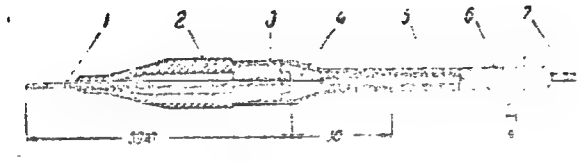
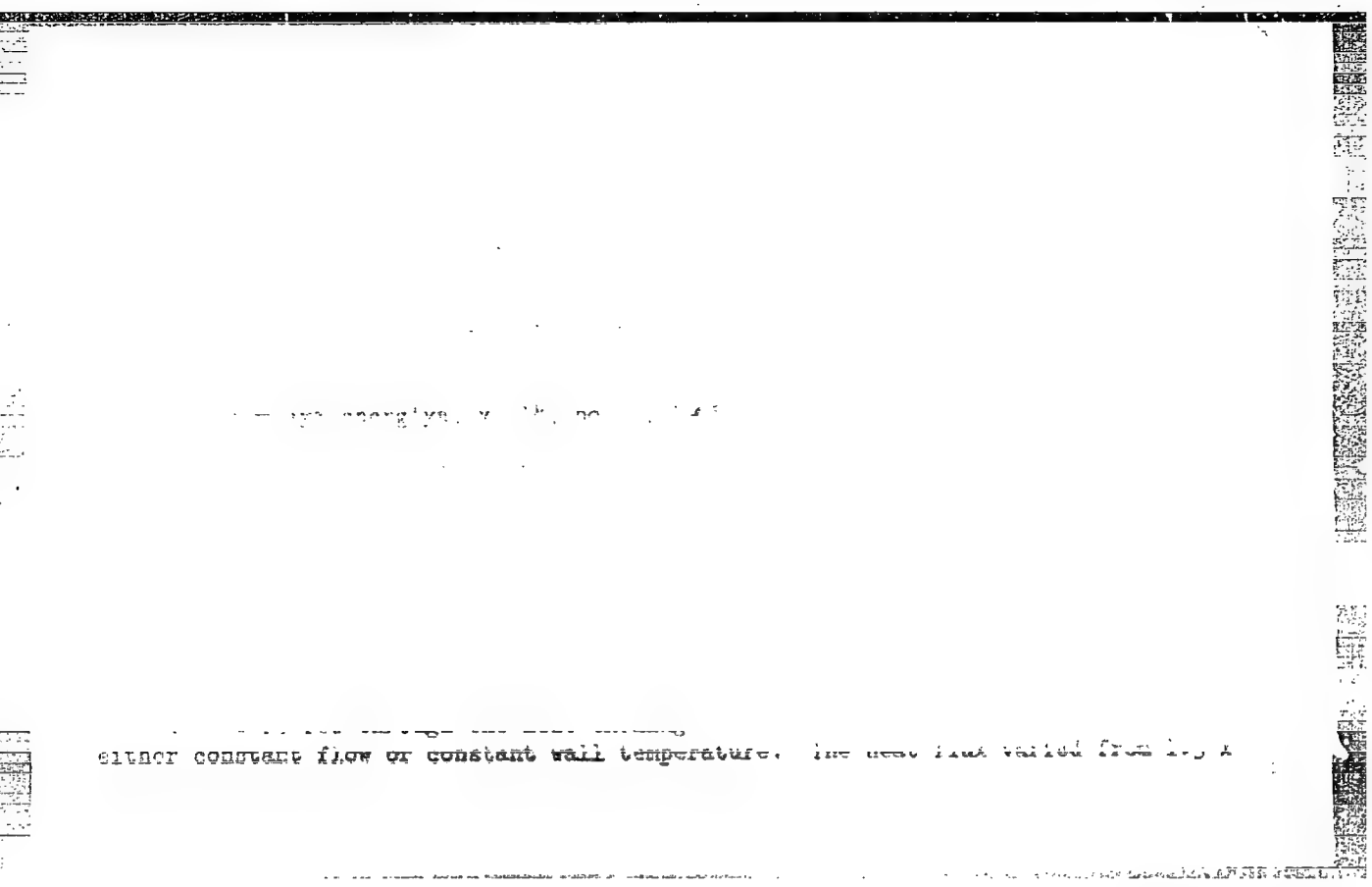
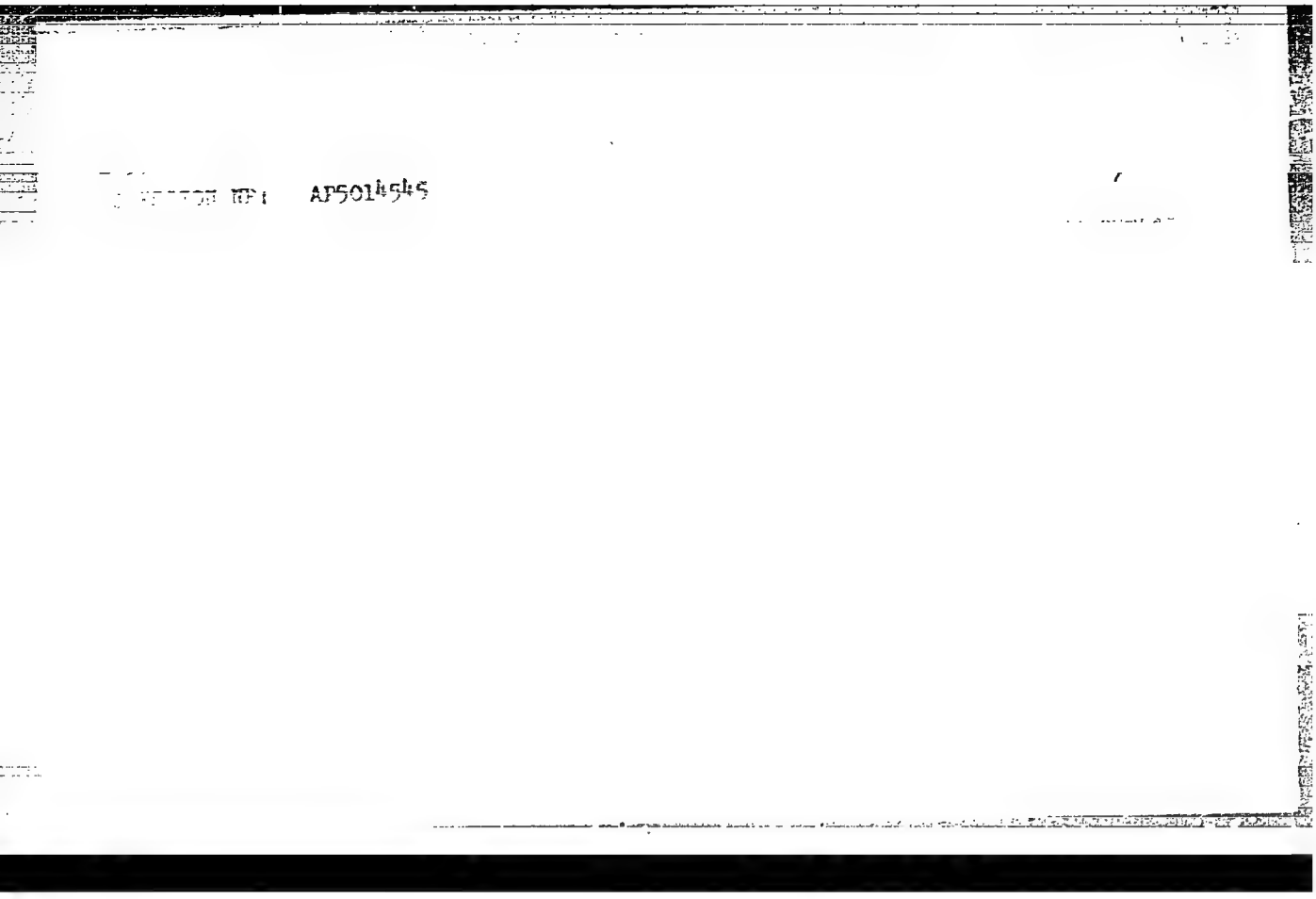


Fig. 1.

Thermocouple for the measurement of surface temperature

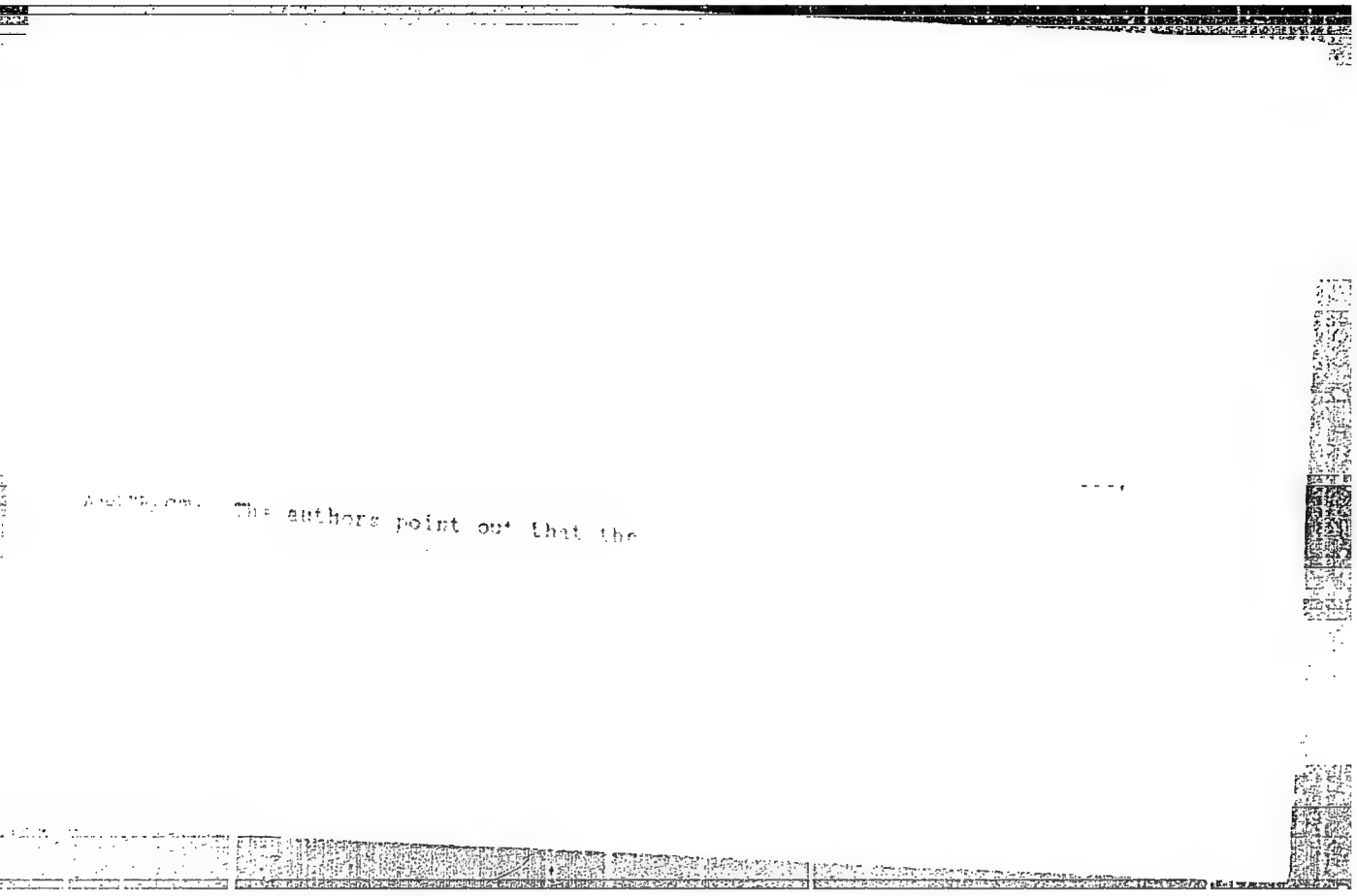


either constant flow or constant wall temperature.



GUBBOTIN, V.I., doktor tekhn. nauk; KRIVTSOV, V.A., inzh.; POKROVSKIY, Yu.N., inzh.; IBRAGIMOV, M.Kh., kand. tekhn. nauk; KHARITONOV, N.P., kand. tekhn. nauk

Small thermocouples for measuring temperature in the reactor of the first atomic electric power plant. Teploenergetika 12 no.5:91-94 My '65.
(MIRA 18:5)



L 21989-66 EWT(1)/EWP(m)/EWA(d)/EWA(1)

ACCESSION NR: AP5025985 UR/0294/65/003/005/0708/0716

532.542.4:546.49:536.5.001.5

AUTHOR: Bobkov, V. P. (Moscow); Gribanov, Yu. I. (Moscow); Ibragimov, M. Kh. (Moscow); Nomofilov, Ye. V. (Moscow); Subbotin, V. I. (Moscow)

TITLE: Measurement of temperature pulsation intensity in the turbulent flow of mercury in a tube

SOURCE: Teplofizika vysokikh temperatur, v. 3, no. 5, 1965, 708-716

TOPIC TAGS: mercury, turbulent flow, ~~pulsexxxxx~~ temperature stabilization, flow meter/Type 46K1 flow meter

ABSTRACT: The temperature pulsations were measured with two thermocouples, located in a single probe. Location of the thermocouples in the experimental section was accurate to ±0.1 mm. The experimental tube had a diameter of 52.2 mm, and was placed vertically. The length of the hydrodynamic and thermal stabilization zone was 30 tube diameters. In some experiments, a grid with an effective section equal to 30% of the cross section of the tube was placed at the inlet of the tube. This grid was a steel plate 2 mm thick with 2.5 mm diameter openings in a square pattern with a spacing of 4 mm. The mercury was circulated in the loop by a Type TsN-2 centrifugal pump. The heat flux was created by an electric heater, and the temperature of the mercury was measured with Chrom-

Card 1/2

I. 21989-66
ACCESSION NR: AP5025985

el-Alumel thermocouples. The statistical characteristics of the flow were measured and automatically recorded with a Type 46K1 correlation meter. The amplifiers had a transmission band from 0.18 to 300 cycles at a level of 0.9. A block diagram of the measuring scheme is given. The temperature pulsation intensity was measured over a Reynolds number range from 5×10^3 to 125×10^3 and a heat flux at the wall from 10^4 to 2×10^4 kcal/m^2-hr, at different inlet conditions. Results are given in tabular form. Analysis of experimental data shows that with a rise in the Reynolds number, the observed nonhomogeneity of the pulsations along the radius of the tube gradually disappears and the maximum intensity degenerates. Comparison of the experimental data for mercury and water indicate that with a rise in the Prandtl number at constant Reynolds number, the maximum intensity of turbulent temperature pulsations becomes more marked and approaches the tube wall. Orig. art. has: 6 figures and 1 table

ASSOCIATION: None
SUBMITTED: 31Jul64 ENCL: 00 SUB CODE: 20
NR REF SOV: 007 OTHER: 005

Card 2/2

L 45669-66 EWT(1)/EWA(m) WW

ACC NR: AP6021215 SOURCE CODE: UR/0294/66/004/003/0380/0388

AUTHOR: Bobkov, V. P. (Moscow); Ibragimov, M. Kh. (Moscow); Nomofilov, Ye. V. (Moscow); Subbotin, V. I. (Moscow)

ORG: none

83

B

TITLE: Investigation of spatial correlation coefficients and transverse temperature excitation scales in the turbulent flow of mercury in a round tube

SOURCE: Teplofizika vysokikh temperatur, v. 4, no. 3, 1966, 380-388

TOPIC TAGS: turbulent flow, Reynolds number, thermocouple, liquid metal, mercury

ABSTRACT: Temperature fluctuations in a turbulent flow of mercury were investigated in the Reynolds number range of 10,000 to 125,000. A pair of thermocouples were used at various positions in the stream and the spatial correlation coefficient was measured. The results are tabulated and graphed. The correlation coefficients were found to approach zero in the center of the stream and their change with the Reynolds number was noted to be greatest at the center. This is taken to indicate the strong dependence of the walls on the turbulence of the flow. The results indicate that transverse variations in temperature fluctuations are similar to those of velocity fluctuations and their scale is comparable to the stream transverse dimension. The analysis of the results is accompanied by an extensive review of turbulence theory

Card 1/2 UDC: 532.5.071.4

L 45669-66

and some discussion of other experimental results. This analysis shows that the experiment satisfies the criterion for the correlation of temperature fluctuations and that measurements at lower Reynolds numbers can be valid, provided the experimental error could be reduced. The results of the analysis and the experiment indicate that the structure of turbulent flow cannot be satisfactorily described in terms of local gradients, but must take account of the statistical fluctuations. Orig. art. has: 6 figures, 9 formulas, 1 table.

SUB CODE: 20/ SUBM DATE: 21Jul65/ ORIG REF: 007/ OTH REF: 005

Card 2/2 fv

L 06973-67 EWT(1)/EWP(m)/EWT(m)/EWP(t)/ETI JD/WW/JG

ACC NR: AP6018355 (A) SOURCE CODE: UR/0089/66/020/005/0425/0425

54
B

AUTHOR: Ibragimov, M. Kh.; Zhukov, A. V.

ORG: none

TITLE: Method of calculating the coefficient of heat exchange for a bundle of fuel rods in a stream of liquid metal

SOURCE: Atomnaya energiya, v. 20, no. 5, 1966, 425

TOPIC TAGS: heat exchange, turbulent heat transfer, turbulent flow, Nusselt number

ABSTRACT: This is an abstract of article no. 79/3502, submitted to the editor and filled, but not published in full. The authors continue their earlier work (atomnaya energiya v. 18, 630, 1965), which was devoted essentially to laminar flow. The present article deals with turbulent flow and the idea of the calculation method consists in taking separate account of the molecular and turbulent components of the Nusselt numbers, and determining these components as functions of the characteristics of the fuel elements and the velocity profiles. The results obtained in this article are applied to turbulent, laminar, and transition flows of liquid metals. Orig. art. has: 2 formulas

SUB CODE: 18,20/ SUBM DATE: 10Nov65/ ORIG REF: 001/ OTH REF: 001

UDC: 621.039.517.3

Card 1/1

L 10331-67 EWT(m)/EWT(l)/EWT(m)/EWP(w) IJP(e) EW/WW/JR

ACC NR: AP6029797 SOURCE CODE: UR/0089/66/021/002/0101/0107

AUTHOR: Ibragimov, M. Kh.; Isupov, I. A.; Kobzar', L. L.; Subbotin, V. I. 72

ORG: none

TITLE: Calculation of tangential stresses on the channel wall and of the velocity distribution in the case of turbulent liquid flow

SOURCE: Atomnaya energiya, v. 21, no. 2, 1966, 101-107

TOPIC TAGS: turbulent flow, nuclear reactor coolant, hydraulic resistance, flow velocity, heat transfer, stress distribution, flow distribution, temperature distribution

ABSTRACT: In view of the extensive use of channels of varying shapes in nuclear reactor installations, and in view of the complexity of standard hydrodynamic flow calculations, the authors propose a simplified method based on results of experimental data on the mechanism of turbulent transfer of momentum in the flowing liquid. Equations are derived for the tangential stresses on the channel wall, the velocity fields and hydraulic resistances in smooth straight channels of arbitrary cross section. The calculation is valid for a hydrodynamically stabilized stream under developed turbulence conditions ($Re > 10^4$). The calculated stress on the walls can be used to calculate the coefficients of turbulent heat transfer and thus solve problems connected with

Card 1/2 UDC: 621.039.517:621.039.517.5

L 10331-67
ACC NR: AP6029797

the determination of the temperature fields and heat-transfer coefficients. The constants involved in the equations for the stress distributions are obtained from experimental data, and the results are compared with data on channels with eight different cross sections. Agreement between the calculations and experiment was found to be within 10%. Orig. art. has: 6 figures, 13 formulas, and 1 table.

SUB CODE: 20, 18/ SUBM DATE: 28Dec65/ ORIG REF: 005/ OTH REF: 005

Card 2/2 nd

ACC NR: AP7002171 SOURCE CODE: UR/0089/66/021/006/0513/0514

AUTHOR: Ibragimov, M. Kh.; Markulov, V. I.; Subbotin, V. I.

ORG: none

TITLE: Random thermal elastic stresses produced in a wall by temperature pulsations

SOURCE: Atomnaya energiya, v. 21, no. 6, 1966, 513-514

TOPIC TAGS: elastic stress, thermal stress, heat transfer, nuclear reactor technology

ABSTRACT: In view of the importance of temperature pulsations on the heat-transfer walls of heat exchangers, the authors present an approximate method of calculating the intensity of random thermal elastic stresses produced by random pulsations of the temperature on the boundaries of a solid. The problem is solved in the thin-plate approximation, using a quasistatic analysis, in view of the low frequency spectrum (0.05 - 5 cps) of the pulsations actually occurring in the case of turbulent heat exchange. The problem is solved for an infinite plate with clamped and free edges. In both cases, the intensity of the thermal stresses increases linearly with the intensity of the temperature pulsations. A plot showing the dependence of the intensity of the temperature pulsations on the Reynolds number in the case of heat exchange between liquid metal and water is also presented and it is shown that in actual nuclear reactors or heat exchangers allowance for the additional stresses may be important. Orig. art. has: 2 figures and 7 formulas.

SUB CODE: 18/ SUBM DATE: 20Jun66/ ORIG REF: 005/ OTH REF: 001

Card 1/1 UDC: 621.039.517.5

TEL'TAYEVA, G.K.; IBRAGIMOV, M.Kh.

Development of subprofessional medical education in Kirghizistan.
Sov. zdrav. Kir. no.4/5:46-49 Jl-O'63 (MIRA17:1)

L 32946-66 EWT(m)/EWP(j)/T/EWP(t)/ETI IJP(c) RM/JW/WE/JD

ACC NR: AP6015898 (A) SOURCE CODE: UR/0249/65/021/009/0016/0019

AUTHOR: Kuliyev, A. M.; Tabatabai, A. M.; Alekperov, G. Z.; Ibragimov, M. M.

ORG: INKhP im. Yu. G. Mamedaliyev

TITLE: Topping of natural gas under pressure

SOURCE: AN AzerbSSR. Doklady, v. 21, no. 9, 1965, 16-19

TOPIC TAGS: degassing, butane, gasoline, natural gas

ABSTRACT: Natural gas containing 11.5 g gasoline per m^3 was topped continuously by a countercurrent fluidized layer of activated carbon (0.5-1.5 mm) in a column at 5 atm. The gas was fed into the bottom of the column (250-320°C) at a rate of 25 m^3/hr; gas flow in the column was 0.1 m/sec and carbon circulation was 100 kg/hr. At a carbon/gas ratio of 4.0 kg/m^3, extraction of gasoline was 100% and that of butane was 90%. By raising the ratio to 6.0 kg/m^3, butane extraction reached 100%. Enrichment of gas to a gasoline content of 45 gm/m^3 did not impair efficiency of extraction. Presented by M. G. Nagiyev, Academician of the AN Azerbaydzhan SSR. Orig. art. has: 4 tables.

SUB CODE: 13,21/ SUBM DATE: 02Mar64/ ORIG REF: 001

Card 1/1

IBRAGIMOV, M.N., inzh.

Universal pile-driver unit for injection work. Gidr.stroi. 32 no.7:46 Jl '62. (MIRA 15:7)
(Grouting) (Boring machinery)

IBRAGIMOV, M.N.

Installation of a seepage control curtain in sand using carbamide resin. [Trudy] NII osn. no. 50:15-19 '62.(MIRA 16:9)